VTG 400D

Programmable Video and Audio Test Generator with SDI/HD-SDI Output

VTG 400D

FEATURES

- **Video outputs: RGBHV on BNC and 15-pin HD connectors, component video on BNC connectors, S-video on a 4-pin mini DIN connector, composite video on a BNC connector, and SDI/HD-SDI on a BNC connector**
- **Audio outputs: 3-pin XLR connector, RCA connector, and 3.5 mm mini stereo audio jack**
- **34 video test patterns** — Includes multiple crosshatch patterns, color bars, PLUGE, crop patterns, geometry, grayscale, and alternating pixel patterns, as well as flat field, window, checkerboard, hum bar, and Patent Pending CTG Contrast Transfer Function patterns with adjustable levels.
- **Seven audio test signals** — Includes sine waves, square waves, pink noise, white noise, polarity, frequency sweeps, and sine wave bursts with selectable frequencies and output levels.
- **101 selectable output rates including high resolution computer-video, HDTV, and NTSC/PAL video** — Provides 101 factory scan rates for high resolution computer-video, HDTV, 16:9, plasma, and RGB, as well as standard definition component video, S-video, and composite video. Also accommodates up to 180 additional user-defined scan rates.
- **Patent Pending Scope-Trigger™ expedites signal/system troubleshooting when using an oscilloscope** — An innovative feature which enables analysis of a specific area within the test pattern image using an oscilloscope. This feature is especially helpful in identifying signal and display imperfections.
- **Four Quick Select memory presets** — User settings including output scan rates and test signal selections can be saved to and recalled from four memory presets via direct access buttons.
- **Broadcast quality video encoder** — Ensures compliance with SMPTE and NTSC/PAL standards for accurate video performance.
- **Auto Sequence mode** — Specific test patterns can be selected for a repeating sequence with selectable time intervals.
- **Selectable RGB color output** — The red, green, or blue color channel can be enabled or disabled via the set-up menu.
- **Auto-memory recall** — Settings are saved when the VTG 400D is turned off and automatically recalled when subsequently powered.
- **RS-232 serial control port for custom scan rate programming, firmware upgrades, and control with Extron SIS™ Simple Instruction Set**
- **Screen Saver mode** — An adjustable timer can be set to engage the VTG 400D in Screen Saver mode, with either the video output muted or as a repeating sequence of test patterns.
- **Main panel security lockout** — All main panel controls except the power button can be locked out to prevent unauthorized use or tampering.
- **Rugged metal enclosure** — Appropriate for field use, but can also be placed on a desktop. For added protection and portability, a soft nylon carrying case is included.
- **Internal international power supply** — The 100-240VAC, 50/60 Hz, universal power supply provides worldwide power compatibility.

DESCRIPTION

The Extron **VTG 400D** is an advanced, programmable, and upgradeable Video and Audio Test Generator that delivers accurate, full bandwidth video signal reproduction and high performance audio test signals. This test generator is a professional quality reference tool for set-up, performance evaluation, calibration, and troubleshooting audio and video systems.

The VTG 400D offers a comprehensive array of video test patterns, as well as a suite of audio reference signals. High resolution RGB computer-video is output simultaneously on BNC and 15-pin HD connectors. NTSC and PAL video is output simultaneously as RGB, component video, S-video, and composite video, while audio output is both balanced on XLR and unbalanced on RCA and 3.5 mm mini jack. An SDI/HD-SDI output is included with the VTG 400D.

The VTG 400D is designed for universal video display compatibility. A total of 101 output scan rates are available for high resolution computer-video, as well as HDTV, NTSC, and PAL. Up to 180 additional rates can be programmed into the VTG 400D. The audio test generator is fully compatible with professional and consumer audio equipment, and delivers accurate performance for microphone level inputs.

Operation of the VTG 400D is intuitive and convenient, with an easy-to-read LCD screen on the main panel, direct access buttons, and memory presets for quick saving and recall of user settings. Programming, upgrading, and adding new test patterns and custom scan rates to the VTG 400D are available through RS-232 using the included Extron control software.

A powerful and innovative feature is the Patent Pending Scope-Trigger™ output, which enables analysis of a selected area within the video image using an oscilloscope. Scope-Trigger delivers quick and easy oscilloscope operation with minimal effort. Any desired location, or pixel, within a video image can be accurately targeted and then simultaneously examined on an oscilloscope via a precisely timed trigger signal from the VTG 400D.

Housed in a rugged, lightweight metal enclosure, the VTG 400D is ideal for both field and permanent A/V applications.

MODEL	VERSION DESCRIPTION	PART #
VTG 400D	Test Generator with SDI/HD-SDI Output	60-564-02

OPTIONAL ACCESSORIES	MODEL DESCRIPTION	PAGE	PART #
SVHSM-BNCF 8" (20 cm)	S-Video Male to 2 BNC Female Adapter	page 795	26-353-01
SYM BNCF/0.5	15-pin HD Male to BNC Female Mini High Resolution Cables	page 777	26-531-01
SYM BNCM/6	15-pin HD Male to BNC Male Mini High Resolution Cables	page 776	26-533-02

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VTG 400D

SPECIFICATIONS

VIDEO SIGNAL CHARACTERISTICS

Dot clock	200 MHz (max.)
Pixel clock accuracy	100 ppm
Horizontal frequency range (factory defaults)	15 kHz to 131 kHz
Vertical frequency range (factory defaults)	30 Hz to 120 Hz
Rise / Fall time	
NTSC, PAL	140 ns
All other signal rates	<4 ns

VIDEO OUTPUT

Number / Signal type	1 RGBHV, RGBS, RGsB, RsGsBs, component video, HDSDI (SMPTE 292M, optional), SDI digital component video (SMPTE 259M-C), S-video, composite video (NTSC/PAL)
Connectors	1 x 5 female BNC (RGB) 1 female 15-pin HD (RGB) 1 x 3 female BNC (component video) 1 female 4-pin mini DIN (S-video) 1 female BNC (composite video) 1 female BNC (SDI/HDSDI)
Nominal level	1 Vp-p for Y of component video and S-video, and for composite video, RsGsBs 0.7 V Vp-p for RGB and for R-Y and B-Y of component video 0.286 Vp-p (burst) for C of NTSC S-video, 0.300 Vp-p (burst) for C of PAL S-video
Minimum / Maximum levels	0.0 V to 1.0 Vp-p
Impedance	75 ohms
Resolutions	Computer (VGA–QXGA), video (NTSC, PAL), HDTV, 16:9 high resolutions, and custom resolutions (user-defined)
Return loss	-30 dB @ 5 MHz
DC offset	0 ±5 mV for RGB and component video, 0 ±5 mV for NTSC S-video and composite video 14 mV ±5 mV for PAL S-video and composite video

SYNC

Output type	RGBHV, RGBS, RGsB, RsGsBs (for RGB signals) Tri-level on Y, R-Y, B-Y channels (component video 720p, 1080i, 1080p) Bi-level on Y channel (for all other component video rates)
Standards	NTSC, PAL, SMPTE 170M, SMPTE 274M, SMPTE 293M, SMPTE 295M, SMPTE 296M
Output level	0.3 Vp-p for RGsB, RsGsBs, component video (bi-level sync) 0.6 Vp-p for RsGsBs, component video (tri-level sync) TTL: 5.0 Vp-p, unterminated for RGBHV, RGBS
Output impedance	75 ohms
Max. Rise / Fall time	5 ns (TTL sync)
Polarity	Positive or negative (scan rate/signal dependent)
Scope trigger connectors	1 BNC female (scope trigger)

AUDIO

THD + Noise	<0.008% typical @ +6 dBu (1.55 V), 1 kHz 0.18% @ -38 dBu (9.75 mV), 20 Hz to 20 kHz
Flatness	±0.05 dB @ 20 Hz to 20 kHz
Accuracy	±0.4 dB

NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu

AUDIO OUTPUT

Number / Signal type	1 mono, balanced; 2 mono, unbalanced
Connectors	(1) 3.5 mm mini stereo jack (unbalanced mono left and right, tip-ring-sleeve) 1 female RCA jack (unbalanced, tip-ring) 1 male 3-pin XLR (balanced) (pin 1 = GND, pin 2 = +, pin 3 = -)
Impedance	50 ohms unbalanced, 100 ohms balanced
Waveforms	Pink noise, white noise, sine wave (fixed/swept burst), square wave, polarity test
Level ranges	Pink noise: -72 dBu to -4 dBu (-74 dBV to -6 dBV) (0.20 mV to 500 mVrms) Polarity test: -72 dBu to -14 dBu (-74 dBV to -16 dBV) (0.20 mV to 158 mVrms) All other signal types: -72 dBu to +6 dBu (-74 dBV to +4 dBV) (0.20 mVrms to 1.58 Vrms)
Maximum level (Hi-Z)	>+6 dBu, balanced or unbalanced at 1% THD+N
Maximum level (600 ohm)	>+4.66 dBu, balanced or unbalanced at 1% THD+N
Crest factor (pink noise)	3.25 (10.24 dB)
Crest factor (white noise)	1.98 (5.95 dB)
Rise time (square wave)	1.5 ms at 20 Hz to 7 µs at 5 kHz
Rise time (polarity test)	5 µs
Frequency accuracy (sine wave)	50 ppm

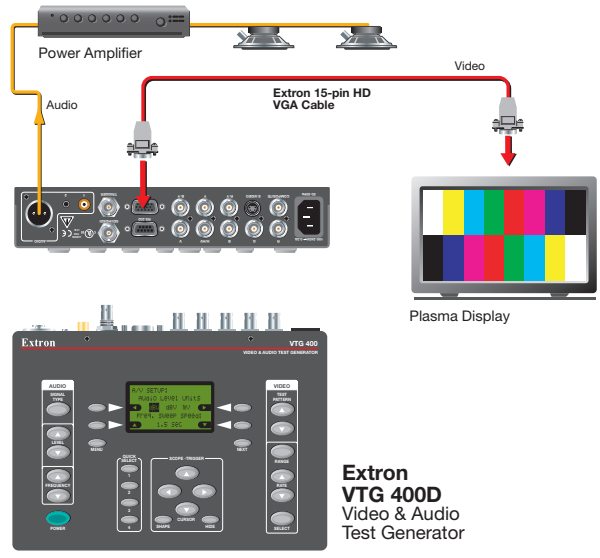
CONTROL / REMOTE – TEST GENERATOR

Serial control port	RS-232, 9-pin female D connector
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

GENERAL

Power	100 VAC to 240 VAC, 50/60 Hz, 15 watts, internal
Temperature / Humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Rack mount	No
Enclosure type	Metal
Enclosure dimensions	6.75" H x 9.0" W x 1.75" D 17.1 cm H x 22.9 cm W x 4.4 cm D (7.5" [19.1 cm] H including connectors.)
Product weight	3.3 lbs (1.5 kg)
Shipping weight	7 lbs (4 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE: All nominal levels are at ±5%. Specifications are subject to change without notice.



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VTG 400D
Video & Audio
Test Generator

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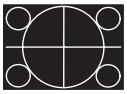
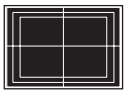
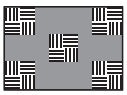
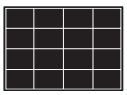
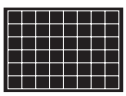
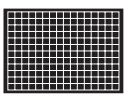
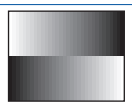
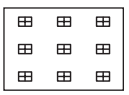
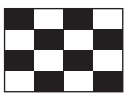
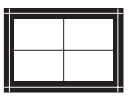
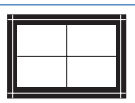
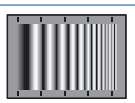
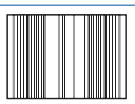
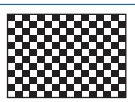
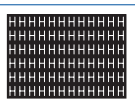
VTG 400D — Test Patterns, Video Output Rates, and Audio Signals

VTG 400D TEST PATTERNS

Circles — Using the circles as a guide, this pattern is used to evaluate and adjust the geometry of the display device. The center crosshatch aids in proper centering.	
Safe Area (5%/10%) — This pattern is used to indicate the safe area of display and inner safe area for titling within NTSC and PAL applications. For graphics displays, this pattern serves as a guide for symmetrical alignment of borders and text.	
Focus Pattern — This pattern can be used to check display focus and resolution.	
16:9 Crop — When the border of this pattern is properly aligned at the edges of a 4:3 screen, the two horizontal lines define proper centering and shape of a superimposed 16:9 image.	
4:3 Crop — When the border of this pattern is properly aligned at the edges of a 16:9 screen, the two vertical lines define proper centering and shape of a superimposed 4:3 image.	
Rectangle/Square Crosshairs — This pattern can be used to properly center the image and set geometry. For CRT-based projectors, this pattern is used to check and adjust gross linearity and static convergence.	
4x4 Crosshatch — This pattern can be used to set up a scaler or video processor for 2x or 4x zoom, or 1/4 or 1/16 downsizing. An application of this crosshatch is setting up videowall displays.	
Coarse Crosshatch — This crosshatch pattern can be used to set projector focus and geometry. For CRT projectors, this crosshatch pattern is for examining and adjusting both static and dynamic convergence.	
Fine Crosshatch — This pattern has twice the number of horizontal and vertical lines as the Coarse Crosshatch. It is useful for critical convergence adjustments with CRT projectors and evaluating optical qualities of projector lenses, such as chromatic aberration.	
PLUGE — The vertical bars are used to set the black level (brightness), while the horizontal bars aid in setting the contrast level for the display.	
32-level Split Grayscale — With two opposing rows of 32 stepped bars of gray between the lowest and highest levels, this pattern is used for setting and assessing grayscale tracking, and evaluating contrast linearity on display.	
Extreme Grayscale — This pattern features shallow grayscale ramps that allow for evaluation of display performance with subtle (very small) grayscale level gradations.	
Ramp — This pattern is used to evaluate the performance of a display or video processor on the basis of its pixel bit depth capability. The pattern should appear to be smooth, with no contouring or stepping.	
Color Bars (8-color split) — This pattern is used for testing all of the video color channels and setting video drive levels. It is also used to check low frequency crosstalk between the red, green, and blue color channels.	
SMPTE Color Bars (with PLUGE pattern) — For NTSC video equipment, the SMPTE color bars are used to set up tint and color, while the PLUGE video pattern is for adjusting brightness and contrast.	
EBU Color Bars (8-color full bars) — The EBU color bars are primarily used to set up color for PAL video equipment.	
80% Window — A window at 80% (80 IRE) video level, surrounded by black, is used in fine tuning the color balance (or grayscale) of a display with the aid of a color analyzer. The gain (or drive) setting is fine tuned for each of the RGB color adjustments.	

VTG 400D TEST PATTERNS

20% Window — A window at 20% (20 IRE) video level, surrounded by black, is used in fine tuning the color balance (or grayscale) of a display with the aid of a color analyzer. The bias (or offset) setting is fine tuned for each of the RGB color adjustments.	
Window (variable level) — The video level of the window can be adjusted between 0% (0 IRE) and 100% (100 IRE) in 1% (1 IRE) steps. This pattern is useful in fine tuning and evaluating grayscale performance of a display.	
Flat Field (variable level) — This pattern is used to evaluate white field uniformity. For RGB signals, each color channel can be selectively enabled to assess color uniformity. The video level is variable between 100% (100 IRE) and 0% (0 IRE) in 1% (1 IRE) steps.	
Flat Field with Targets (variable level) — This pattern is similar to Flat Field, with targets added to support the ANSI measurement method for determining display brightness.	
Checkerboard (variable level) — This is the ANSI contrast ratio test pattern, for measuring contrast ratio as well as adjusting and assessing CRT display performance. This reversible pattern is variable in level between 100% (100 IRE) and 0% (0 IRE) in 1% (1 IRE) steps.	
Bounce (automatic) — The center window alternates between 90% and 10% average picture level at 0.5 second intervals. This pattern is used for checking high voltage regulation on CRT displays, as well as black level stability.	
Bounce (manual) — This is similar to the automatic Bounce pattern, but allows the user to manually toggle between 90% and 10% average picture level.	
Alternating Pixels — This one pixel "on," one pixel "off" pattern is used for assessing the performance of high resolution monitors and projectors, EMI testing for worst case radiation, and pixel clocking and pixel phasing adjustments on a digital display.	
Frequency Sweep — These alternating "on" and "off" vertical bars are used to evaluate the frequency response of an NTSC or PAL video system.	
Graphics Multiburst — This pattern of grouped alternating bars at the highest "on" and lowest "off" video levels is used to test display resolution capability for computer-video and HDTV.	
Multiburst — This pattern of grouped alternating bars at the highest "on" and lowest "off" video levels with increasing frequency is used to test bandwidth performance for NTSC and PAL video.	
Alternating Pixels (2-dimensional) — This offset, one pixel "on", one pixel "off" pattern is used for fine-tuning pixel clocking and pixel phasing adjustments for high resolution digital displays.	
Multipulse — This pattern is used to measure the frequency response and group delay of the NTSC/PAL transmission channel.	
Transient Response — The high and low levels bars against the gray background are used for evaluation of transient response of the video signal.	
Contrast Transfer Function (CTF) — This pattern is for evaluation of total video system response. The VTG 400 LCD display provides an indication of contrast transfer percentage when the user has matched the brightness of the horizontal lines to that of the vertical lines.	
H Pattern — This pattern is used to check or evaluate video clamping stability, focus for projectors, and video pulse response, as well as to simulate text. The user can toggle between white-on-black and black-on-white.	
Hum Bar Test (variable level) — This pattern is used to reveal the presence of any hum bars which indicate interference attributable to the video signal or the equipment. The test pattern level is adjustable from 1% to 100%.	

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VTG 400D — Test Patterns, Video Output Rates, and Audio Signals

COMPUTER SCAN RATES				
Rate Name	**Resolution**	**H (kHz)**	**V (Hz)**	**Format**
VGA	640 x 480	31.5	60	RGB
VESA2 (VGA)	640 x 480	37.9	72	RGB
VESA1 (SVGA)	800 x 600	35.2	56	RGB
VESA5 (SVGA)	800 x 600	37.9	60	RGB
VESA6 (SVGA)	800 x 600	48.1	72	RGB
VESA3 (XGA)	1024 x 768	48.4	60	RGB
VESA4 (XGA)	1024 x 768	56.4	70	RGB
XGA5	1024 x 768	57	70	RGB
VESA8 (XGA)	1024 x 768	60	75	RGB
VESA9 (XGA)	1024 x 768	68.7	85	RGB
VESA10 (XGA+)	1152 x 864	67.5	75	RGB
1280 x 960	1280 x 960	60	60	RGB
1280 x 960	1280 x 960	70	70	RGB
1280 x 960	1280 x 960	75	75	RGB
VESA11 (SXGA)	1280 x 1024	64	60	RGB
VESA12 (SXGA)	1280 x 1024	91.1	85	RGB
SXGA+1	1400 x 1050	63.9	60	RGB
SXGA+2	1400 x 1050	65.3	60	RGB
VESA13 (UXGA)	1600 x 1200	75	60	RGB
VESA14 (UXGA)	1600 x 1200	87.5	70	RGB
VESA15 (UXGA)	1600 x 1200	106.3	85	RGB
QXGA	2048 x 1536	115	71.8	RGB
LCoS1	1360 x 1024	80	75.1	RGB
LCoS2	1365 x 1024	65.2	60	RGB
WORKSTATION RATES				
SGI	640 x 480	31.5	60	RGB
SGI	640 x 512	32.22	60	RGB
SGI	800 x 600	37.8	60	RGB
SGI	960 x 680	42.84	60	RGB
SGI	960 x 620	39.06	60	RGB
SGI	1024 x 768	48.36	60	RGB
SGI	1024 x 768	40.3	50	RGB
SGI	1200 x 900	68.04	72	RGB
SGI	1280 x 1024	53.25	50	RGB
SGI	1280 x 1024	63.9	60	RGB
SGI	1280 x 1024	76.68	72	RGB
SGI	1500 x 1200	75.6	60	RGB
SGI	1600 x 1024	63.38	60	RGB
SGI	1600 x 1200	75	60	RGB
SGI	1760 x 1100	71.04	60	RGB
SGI	1920 x 1035	33.75	60/30	RGB
SGI	1920 x 1080	33.72	60/30	RGB
SGI	1920 x 1080	70.31	60	RGB
SGI	1920 x 1080	84.37	72	RGB
SGI	1920 x 1200	77.52	60	RGB
SGI	1920 x 1200	85.27	66	RGB
SGI	2048 x 1120	83.45	72	RGB
SUN	1152 x 900	61.8	66	RGB
SUN	1152 x 900	71.7	76	RGB
SUN	1280 x 1024	81	76	RGB
SUN	1600 x 1280	89.3	67	RGB
SUN	1920 x 1080	84.4	72	RGB
SUN	1920 x 1200	87.2	70	RGB
SUN	1920 x 1200	93.6	75	RGB

STEREOGRAPHICS RATES				
Rate Name	**Resolution**	**H (kHz)**	**V (Hz)**	**Format**
Stereographic VGA	640 x 222	31.5	120	RGB
SGI Stereo	640 x 480	60.84	120	RGB
SGI Stereo	640 x 512	65.28	120	RGB
SGI Stereo	1024 x 768	96.84	120	RGB
SGI Stereo	1024 x 768	77.47	96	RGB
SGI Stereo	1120 x 840	84.38	96	RGB
SGI Stereo	1280 x 1024	124.6	114	RGB
SGI Stereo	1280 x 1024	131.16	120	RGB
SGI Stereo	1280 x 492	63.96	120	RGB
SUPER HIGH RES RATES				
Cornerstone	1600 x 1800	105	76	RGB
Extron	1280 x 1024	92	86.8	RGB
Extron	1600 x 1280	95	70.9	RGB
Extron	1800 x 1440	105	70	RGB
16:9 HIGH RES RATES				
16:9 HR	848 x 480	31.02	60	RGB
16:9 HR	852 x 480	31.8	60	RGB
16:9 HR	960 x 540	33.78	60	RGB
16:9 HR	1024 x 576	44.04	60	RGB
16:9 HR	1024 x 576	52.85	72	RGB
16:9 HR	1280 x 768	45.11	56.25	RGB
16:9 HR	1280 x 768	48.36	60	RGB
16:9 HR	1360 x 765	47.7	60	RGB
16:9 HR	1365 x 768	47.7	60	RGB
16:9 HR	1366 x 768	47.8	60	RGB
16:9 HR	1920 x 1080	67.2	60	RGB
16:9 HR	1920 x 1200	74.6	60	RGB
HDTV RATES				
480p	720 x 483	31.47	59.94	Y, R-Y, B-Y, RGB
576p	720 x 576	31.25	50	Y, R-Y, B-Y, RGB
720p	1280 x 720	44.96	59.94	Y, R-Y, B-Y, RGB, HDSDI*
720p	1280 x 720	45	60	Y, R-Y, B-Y, RGB, HDSDI*
720p	1280 x 720	37.5	50	Y, R-Y, B-Y, RGB, HDSDI*
1080i	1920 x 1080	33.72	29.97	Y, R-Y, B-Y, RGB, HDSDI*
1080i	1920 x 1080	33.75	30	Y, R-Y, B-Y, RGB, HDSDI*
1080i	1920 x 1080	28.13	25	Y, R-Y, B-Y, RGB, HDSDI*
1080p	1920 x 1080	67.5	60	Y, R-Y, B-Y, RGB
1080p	1920 x 1080	33.75	30	Y, R-Y, B-Y, RGB, HDSDI*
1080p	1920 x 1080	33.72	29.97	Y, R-Y, B-Y, RGB, HDSDI*
1080p	1920 x 1080	56.25	50	Y, R-Y, B-Y, RGB
1080p	1920 x 1080	28.13	25	Y, R-Y, B-Y, RGB, HDSDI*
1080p	1920 x 1080	27	24	Y, R-Y, B-Y, RGB, HDSDI*
1080p (sf)	1920 x 1080	27	24	Y, R-Y, B-Y, RGB, HDSDI*
1080p (sf)	1920 x 1080	26.97	23.98	Y, R-Y, B-Y, RGB, HDSDI*
1035i	1920 x 1035	33.75	30	Y, R-Y, B-Y, RGB, HDSDI*
1035i	1920 x 1035	33.72	29.97	Y, R-Y, B-Y, RGB, HDSDI*
VIDEO RATES				
NTSC	720 x 480	15.7	60/30	VID, Y/C, Y, R-Y, B-Y, RGB, SDI*
NTSC 0 IRE (JPN)	720 x 480	15.7	60/30	VID, Y/C, Y, R-Y, B-Y, RGB, SDI*
PAL - I	720 x 576	15.6	50/25	VID, Y/C, Y, R-Y, B-Y, RGB, SDI*
PAL - B, G, H	720 x 576	15.6	50/25	VID, Y/C, Y, R-Y, B-Y, RGB, SDI*
PAL - N	720 x 576	15.6	50/25	VID, Y/C, Y, R-Y, B-Y, RGB, SDI*

* VTG 400D only

VTG 400D AUDIO LEVELS			
Pink Noise	-72 dBu to -4 dBu	-74 dBV to -6 dBV	.20 mV to 500 mV
Polarity Test	-72 dBu to -14 dBu	-74 dBV to -16 dBV	0.20 mV to 158 mV
All other signal types	-72 dBu to +6 dBu	-74 dBV to +4 dBV	0.20 mV to 1.6 V

VTG 400D AUDIO TEST SIGNALS	
White Noise	A randomly generated audio signal (noise) with equal energy at every frequency. Used in audio level measurement and equipment calibration.
Pink Noise	A variant of white noise with equal energy at every octave. Used in testing and calibrating loudspeakers and sound systems.
Sine Wave	Used in detecting distortion. The frequency can be set from 20 Hz to 20 kHz (in 1/3 octave steps).
Square Wave	Square wave signal with 50% duty cycle and no DC offset. The frequency can be set from 20 Hz to 5 kHz.
Swept Sine Wave	Varies the frequency of a sine wave signal continuously from 20 Hz to 20 kHz. Used to detect driver defects and mechanical sources of distortion.
Polarity test	Positive phased pulse with 1 sec. intervals used to determine proper polarity in wiring audio electronics and loudspeakers.
Sine Wave Burst	A sine wave of a specified frequency that is gated on and off for fixed intervals. Used in testing the transient response of audio systems.

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